

## **Therapeutic options for controlling fluids in the visual system**

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### **Abstract**

Visual Impairment/Intracranial Pressure (VIIP) is a newly recognized risk at NASA. The VIIP project examines the effect of long-term exposure to microgravity on vision of crewmembers before and after they return to Earth. Diamox (acetazolamide) is a medication which is used to decrease intraocular pressure; however, it carries a 3% risk of kidney stones. Astronauts are at a higher risk of kidney stones during spaceflight and the use Diamox would only increase the risk; therefore alternative therapies were investigated. Histamine 2 (H2) antagonist acid blockers such as cimetidine, ranitidine, famotidine and nizatidine are typically used to relieve the symptoms of gastroesophageal reflux disease (GERD). H2 receptors have been found in the human visual system, which has led to research on the use of H2 antagonist blockers to control fluid production in the human eye. Another potential therapeutic strategy is targeted at aquaporins, which are water channels that help maintain fluid homeostasis. Aquaporin antagonists are also known to affect intracranial pressure which can in turn alter intraocular pressure. Studies on aquaporin antagonists suggest high potential for effective treatment. The primary objective of this investigation is to review existing research on alternate medications or therapy to significantly reduce intracranial and intraocular pressure. A literature review was conducted. Even though we do not have all the answers quite yet, a considerable amount of information was discovered, and findings were narrowed, which should allow for more conclusive answers to be found in the near future.